

SYNTAX

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PERSONAL COMPUTERS

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WINTER CONSUMER ELECTRONICS SHOW REPORT

Timex's TS2040 thermal printer will hit the stores this quarter. Priced at \$99.95, it matches both TS1000 and TS2000 machines in color and styling and works with either one.

Timex will deliver TS2000s, the US version of the ZX Spectrum, during 2nd quarter 1983. Priced at \$199.95 for 48K RAM, this 8-color computer sets a tough value standard for others to meet. You'll also see a 16K version for \$149.95. Timex also announced tiny (1 1/2 x 2 x 1/8) TS2000 cartridge software up to 32K ROM, priced below \$25.

SYNTAX thinks TS2000s will differ from Spectrum machines by more than TV scan rate. We expect Sinclair BASIC listings will be mostly compatible and programs with ROM calls or systems variables will need modification. TS1000 tapes need special software to load into TS2000s and then need modified system variables and translation to ASCII.

As others hawked TS1000 clones for March or June delivery, Timex countered with a \$15 rebate on TS1000s during the first quarter.

Mindware printers are in stores now and Mindware showed full screen dump on the MW100 Sidewinder using 1 3/4" wide tape plus 132 column x 12 line printouts printed lengthwise on the tape. We also saw Quickload operate--impressive, reliable and fast.

For those who must check out competitive machines, you'll want to see these: B/W--TI 99/2, Sanyo PHC20, and VZ200; Color--Mattel Aquarius, Sanyo PHC25, Spectravideo SV 318, & Panasonic JR 200 (Highest-priced last; all \$99-299 at retail, available midyear).

FORTH enthusiasts--look at the Jupiter ACE, designed by Stephen Vickers and Richard Altwasser. Available in the US from Data-Assette of Oxford, PA, this machine has FORTH in ROM with the Z80A processor bus available at the rear. Many ZX/TS accessories will work with special cables.

Sinclair has discontinued kit sales.

NEW PRODUCTS AND SERVICES

Crash Guard, made of heavy acrylic, protects your 16K RAM from accidental unplugging. \$19.95, 10-day trial, satisfaction guaranteed. Expense Cutters Products Inc., POB 9543, Raytown, MO 64133.

Free machine code wall charts. Send mailing tube/large envelope with name, address, zip and 35 cents for postage (stamps O.K.). Henri Poche', 5751 River Rd., New Orleans, LA 70123.

Zip-sorted, adhesive-backed mailing lists available: US user groups (about 60), \$6 ppd; software suppliers (about 200), \$11 ppd; hardware suppliers (about 85), \$6 ppd; ZX/TS owners being compiled, to add your name send it with address and zip. TSG Enterprises, 54 Richwood Pl., Denville, NJ 07834.

Domino arcade game now available. Program on cassette, \$9.95 check or MO. More info: JPR Software, Box 4155, Winter Park, FL 32793.

Biocal Software has a new free catalog. Send legal-size SASE to Biocal Software, 340 Cypress Drive, Fairfax, CA 94930.

Plug-in MEMOCALC gives spreadsheet analysis of any table of numbers. Screen acts as a window to table. Maximum size of table is determined by memory capacity; with 64K, you get up to 250 rows or 99 columns. Performs iterative calculations and re-evaluates. Memotech Corp., 7550 W. Yale Ave., Suite 200, Denver, CO 80227, 303/986-1516.

Blank C-5, C-10 and C-12 computer tapes, labels, packaging and marketing, data cassette duplication. PC board layout and manufacture for your hardware. Limited disk and EPROM duplication. Free brochure. Computer Engineering Services, P.O. Box 1222, Show Low, AZ 85901.

Loan Analysis Program (needs 16K) reduced. Helps analyze loans, calculate compound interest and depreciation. Also calculates monthly payment for existing or new loan; duration of pay back on loan; affordable loan amount; amortization tables and more. On tape \$9.95 plus \$1.50 P&H. R.S. Panwar, 2035 Kentland Dr., Houston, TX 77067

32K plus I/O unit gives 4 parallel I/O ports and 32K memory to ZX/TS. Unit plugs into back of ZX/TS and connects to other devices. Can interface to A/D converters and temperature probes through ports. Complete unit (4 ports, 32K, cables for ports, documentation) is \$155 +\$4.95 P&H. Partially populated board (I/O ports and room for 32K expansion later) is \$50+\$4.95 P&H. Wisconsinc Electronics, POB 332, Milton, WI 53563.

METAGRAPHICS creates drawings with over 2000 graphics characters and backgrounds, \$12.95. Needs 16K, on tape. Calliope Software, 4130 Coe Dr. NE, Albuquerque, NM 87110.

GRAPHPAK features bar graphs, line graphs, pie charts and area graphs. Plots data and helps in financial planning. 10K BASIC program on tape is listable. \$14.95 with P+H. Practical Computer Products, 21111 Strathmoor Ln., Huntington Beach, CA 92646.

Decision Maker helps you decide by helping you evaluate options. It scores points statistically and ranks options in order of benefit. Career Path is based on psychological theory linking personality to career decisions. Both need 16K, are user friendly, documentation, \$14.50 each plus \$1.50 P&H. Melear Marketing, 3615 Saxon Way, Marietta, GA 30062, 404/977-1295.

SixPac includes FORTH interpreter/compiler, spreadsheet, inventory management, calendar, household

budget, and data base management programs. Each program includes documented source listing and instructions; needs 16K. Package, \$24.95+\$3 P&H. SofTek, Box 4232, Santa Fe, NM 87502.

Prevent memory module "wobble and die" syndrome. RAMSTRAP holds RAM pack in place. \$3, \$3.50 outside US. RAMSTRAP, 104 Ridgeway Ave., Louisville, KY 40207.

TS1000s with built-in rechargeable battery back-up protect against temporary power loss, also power 16K RAM pack (not supplied). Power on/off switch and indicator LEDs provided. TS1000-B30 (\$129.50 ppd. in US) runs on battery up to 30 minutes, TS1000-B60 (\$142.50) protects against power loss up to 1 hour. FOURIER Analysis and Synthesis evaluates harmonic content of repetitive waveform. Inverse operation, constructing wave that results from known harmonics, is also possible. Comprehensive data review, editing and graphing routines included. Tape includes sample runs and memory saver version for higher resolution. Needs at least 16K; listing and documentation \$12; listing, documentation, tape \$17 ppd. MULTIPROGRAM gives multiple program storage and assumes no previous knowledge of MC programming; step-by-step instructions take you through block transfers. Needs at least 16K, tape and instructions \$10 ppd. Battery back-up plans with schematics and parts list, \$10 ppd. Syncware Co., POB 5177, El Monte, CA 91734.

f/22 Press cuts their 16K Darkstar darkroom package (Oct.82 New Products) to \$400. Tape with instructions, \$49.95. f/22 Press, Bx 141, Leonia, NJ 07605, 201/568-6250.

Hunter's 8K nonvolatile RAM board kit now comes supplied one 6116LP3 (150ns) CMOS RAM at no extra cost. Low power 6116 chip means lithium

should last 10 times longer--fully populated board should retain memory for about 2 years. Assembled and tested version, \$46.90; Kit, \$31.90 with P&H. Hunter, 1630 Forest Hills Dr., Okemos, MI 48864.

Draw and Recall lets you draw on your TV screen and store picture for later recall. Similar to Turtle graphics, enter an angle and distance, and program draws the line. Includes erase, move without drawing, delete, display screen position. Needs 16K, tape with directions \$6.95 +\$1.75 P&H. Plan displays with 8 1/2" x 11" graphic grids, with line and column numbers, X and Y coordinate numbers. Pack of 100 \$3.95+.75 P&H. New newsletter for ZX/TS owners, first issue free to SYNTAX readers; send SASE. Trig Teacher program teaches basic trigonometry, includes examples. \$6.95+\$1.75, on tape with directions. Needs 16K. Friendly Computer, P.O. Box 122, Wallingford, PA 19086.

In-Line Load Monitor helps you load taped software every time. In-Line Voltage Dropper lowers computer voltage so computer and RAM pack run cooler. Assembled with directions, \$12.95 each plus \$1.50 P&H; add 6% tax in NJ. M.C. Hoffman Co., POB 117, Oakland, NJ 07436.

Big selection of ZX/TS-related US and Canadian products. Free mail order list for customers and full product listing for prospective dealers. Integrated Data Systems, 11 Brighton Ave., Toronto, Ontario, Canada M4M 1P3, 416/466-5571.

16K tape programs: Math Raiders, Superchess, Alpha and Vowel Tutor, and Night Gunner. The Adventures of Quest for the Holy Grail and The Elusive Mr. Big K give you a new version everytime you load. \$14.95 each except Superchess, \$19.95. Softsync, 14 East 34th St., New York, NY, 10016. 212/685-2080.

USERS' GROUPS

Our latest list of new users' groups is presented below. To locate or announce a group not listed, drop us a line (please include self-addressed stamped envelope) or give us a call at 617/456-3661. SYNTAX, RD 2, Box 457, Harvard, MA, 01451.

Chateaugay, PQ, Canada: H. Oeder, 305 Radisson, Chateaugay, PQ, J65 1W6 Canada, 514/691-4433.

Gainsville, FL: Timex Users Group, 3708 Newberry Rd., Gainsville, FL 32607, c/o Skipper's Electronics 904/373-6796.

Glen Aubrey, NY: Sinclair Computer Users Society, P.O. Box 92, Glen Aubrey, NY 13777.

Groton, MA: Sinclair users group for people under 16. Aarre Laakso, 74 Ames Rd., Groton MA 01450.

Holly Hill, FL: Richard Sirekis, 941 Oleander Ave., Holly Hill, FL 32017.

Lubbock, TX: Wayne Hamlin, Box 6342, Lubbock, TX 79413.

Manhattan Beach, CA: J. Petersen, 2316 Walnut Ave., Manhattan Beach, CA 90226, 213/545-9581.

Milwaukee, WI: The ULTRAGROUP, 6808 N. Park Manor Dr., Milwaukee, WI 53224.

Puerto Real, PR: ZX/TS Users' Group, Sergio Perez Davila, Box 38, Puerto Real, PR 00740.

Santurce, PR: Max Ramirez de Arellano, Box 6759, Santurce, PR 00914.

SYNTAX ERRORS: Crash Guard, Jan. New Products, was listed at \$10.95. Actual price is \$19.95.

John Jarrett of Computer Engineering Services called to say that his video upgrade kit (adds SLOW mode to 8K ZX80s) does in fact work with new (bug-free) 8K ROMs if installed properly (Dear Editor, Jan. 83). Hint: the wire from point G must be separate and as short as possible. C.E.S. no longer sells complete kits. Printed circuit board plus parts list and directions now \$12.95. Computer Engineering Services, POB 1222, Show Low, AZ 85901, 602/537-7522.

M.C. Hoffman's catalog, Jan. New Products, costs \$1 (refunded with order). The clip is free.

PROGRAM IMPROVEMENTS/REFINEMENTS

Richard Cox sent this change to speed play and add headings to BLACKJACK (Jan.-Apr. 82):

```
5 FAST
605 PRINT AT 1,4;"BLACKJACK"
606 PRINT AT 2,4;"# "
765 PRINT AT 18,0;"YOU";TAB 14;
"DEALER"
```

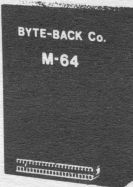
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CHECKS



SWEETHEARTS--8K/1K

Draw a heart with a valentine message in the middle. You can change the message with 210 PRINT AT 6,11;"I LOVE YOU" and add your name at the bottom with 220 PRINT AT 18,20; "xxxxx" (replace xs with your name). To run, GOTO 30.

Larry Allen, Owensville, IN

```

10 PRINT AT A,B;CHR$ 151
20 RETURN
30 FOR A=1 TO 4
40 FOR B=11-A TO 11+A
50 GOSUB 10
60 NEXT B
70 FOR B=20-A TO 20+A
80 GOSUB 10
90 NEXT B
100 NEXT A
110 FOR A=5 TO 9
120 FOR B=7 TO 21
130 GOSUB 10
140 NEXT B
150 NEXT A
160 FOR A=10 TO 17
170 FOR B=A-2 TO 33-A
180 GOSUB 10
190 NEXT B
200 NEXT A
210 PRINT AT 6,13;"HAPPY";AT 7,
11;"VALENTINE"
SYNTACTIC SUM: 22430, 8K ROM

```

BLAST--8K/16K

Combining Robert Nappi's Star Hunter (Nov.82) and Dan Tandberg's Blast Effects (Aug.82) with my own programming resulted in Blast.

You fire your cannon by hitting 0. Hit 7 to aim the cannon up and hit 6 to aim down. To RUN, GOTO 2. Inverse video lines are:

```

2 "BLAST--A SHOOT OUT"
60 "(space, 27 times)"
200 "ER7"
355 "SMASH"
420 "YOU STINK--I WON"

```

James Eischen, Windsor, CT

```

1 SAVE "BLAST"
2 PRINT AT 10,5;"BLAST--A SHOOT OUT"
3 PRINT AT 17,4;"PRESS ANY KE
Y TO START"
4 IF INKEY$="" THEN GOTO 4
5 CLS
10 RAND
20 LET R=0
30 LET P=0
40 LET R=R+1

```

```

50 SLOW
60 LET A$=""
70 LET B$="XXXXXXXXXXXXXXXXXXXXX
XXXXXXXX"
80 LET G$="*****"
90 LET H$="=====
=====
-----"
100 LET I$="-----"
110 LET J$=""
120 LET A=11
130 LET B=0
140 LET O=INT (RAND*20)+1
150 LET W=O+8
160 IF O-A>W-B THEN GOTO 140
170 CLS
180 PRINT AT 0,25;P
200 PRINT AT A,B;" "
210 PRINT AT A+1,B;" "
220 PRINT AT A-1,B;" "
230 IF INKEY$="6" THEN LET A=A-
1
240 IF INKEY$="7" THEN LET A=A+
1
250 PRINT AT O,W;"(<+)"
260 LET W=W-R
270 IF W<2 AND ABS (A-O)<2 THEN
GOTO 420
280 IF W<2 THEN GOTO 120
290 IF INKEY$="0" THEN GOTO 310
300 GOTO 200
310 PRINT AT A,B+3;A$;AT A,B+3;
B$;AT A,B+3;G$;AT A,B+3;H$;AT A,
B+3;I$;AT A,B+3;J$;
320 PAUSE 5
340 IF A=0 THEN GOTO 355
350 GOTO 200
355 LET K$="SMASH"
356 LET J$="SMASH"
360 PRINT AT O,W;K$;AT O,W;J$;A
T O,W;K$;AT O,W;J$;AT O,W;K$;AT
O,W;J$;AT O,W;K$;AT O,W;J$
370 LET P=P+150
380 PAUSE 20
390 IF P>1500 THEN GOTO 450
400 GOTO 120
420 PRINT AT O,W;"DU STINK--I
WIN"
430 PAUSE 100
440 GOTO 20
450 CLS
460 PRINT AT 15,0;"YOU WON",,,,
"WITH 9/10 LUCK AND 1/10 BRAIN",
,"TRY AGAIN"
470 PAUSE 200
480 CLS
490 GOTO 2
SYNTACTIC SUM: 11515, 8K ROM

```

ON GOTO STATEMENTS

Many BASICS give useful ON... GOTO...statements which, unfortunately, ZX/TS BASIC lacks.

Let's tell our computer ON A GOTO 125, 385, 720. It goes to 720 if A=3. The computer goes to the line which lies Ath in the list.

One way to mimic this command is to substitute IF A=1 THEN GOTO 125, IF A=2 THEN GOTO 385 and so

on. These multiple IF statements eat memory, but replacing ON A GOTO with GOTO G(A) can work.

DIMENSION numeric array G with as many elements as line numbers in the ON...GOTO list; assign each element in G with a line number. Our example uses LET G(1)=125, LET G(2)=385, LET G(3)=720. Do this in immediate mode (with no line number) to save memory, then remember to use GOTO 1 instead of RUN to avoid erasing G.

Robert Nee, Maplewood, NJ

WHEN YOU FORGET SYNTACTIC SUM--8K

If you have just entered a program from SYNTAX or SQ and want to check Syntactic Sum but neglected to load the program, add the following program and RUN 9600. You can use either FAST or SLOW mode, but SLOW takes some time. To check that you have entered it correctly, enter Syntactic Sum by itself and RUN. "S" equals zero.

Lloyd Painter, Quakertown, PA

```
9600 LET S=0
9601 FOR A=16509 TO PEEK 16396+2
56*PEEK 16397-1
9602 LET S=S+PEEK A
9603 NEXT A
9604 PRINT "S=";S-7323
SYNTACTIC SUM: 7323, 8K ROM
```

CONCATENATING MACHINE CODE--8K/1K

When you want to use two or more machine language routines in one program, there's no need to load them separately. Since each machine language routine is complete within itself, it can be placed one after another in one routine and individually called by referring to their beginning addresses. Converting machine code to hexadecimal and writing the resulting hex in a REM line makes concatenation easy. The example program contains the hex representation of the Syntactic Sum

program (Jun.81) and the Renumber routine (Jun.82).

Before you typing or loading (regardless of attached memory),

```
POKE 16388, 198
```

```
POKE 16389, PEEK 16389-1 and NEW
```

to reserve memory for ML routines.

Type SAVE, RUN and write down the displayed values. The first value shown is the beginning address of the first routine (Syntactic Sum). PRINT USR that value to get Syntactic Sum. The second value represents Renumber's starting address. RAND USR that value to renumber.

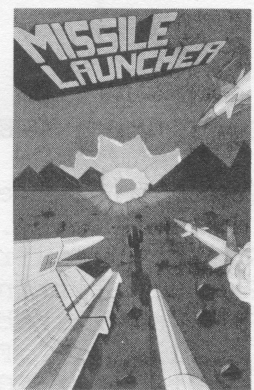
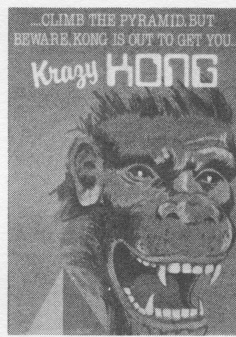
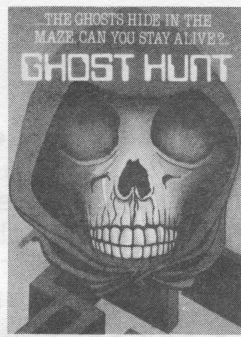
Renumber makes the first line of the program 10 and increments by 10. It does not renumber GOTO and GOSUB destinations. You must edit them individually.

In line 4, 16628 was calculated by adding 2 less than the number of characters in REM line (114) to the address 16514 (16514 is the address of the first byte of machine code in line 10). In line 5, 16576 is the number of characters in the first routine (62) added to 16514 and marks the beginning of the second routine. Number 198 in the above POKE is 256 less half the total number of characters, 58.

Line 2 gets the beginning address of the first routine and line 5 gets the second routine. Line 6 PEEKs hex from the REM line, and converts it to decimal, then POKES it to reserved memory.

Rolf L. Miller, Ventura, CA

```
1 REM 217D40ED5B0C40DD2100007
CBA20087DBB2004DDE5C1C94E0600DD0
92318EC217D40110A00722373234E234
623097ED676C8010A00E009EB18EB
2 LET A=PEEK 16388+PEEK 16389
*256
3 PRINT A
4 FOR X=16514 TO 16628 STEP 2
5 IF X=16576 THEN PRINT A
6 POKE A, (PEEK X-20)*16+PEEK
(X+1)-28
7 LET A=A+1
8 NEXT X
SYNTACTIC SUM: 14684, 8K ROM
```



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All programs use 16K RAM.

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Mass. Residents Tax		5%	
		Total	

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- **OCCASION CALENDAR** Keep track of birthdays, anniversaries, meetings and special events. Have your calendar appear on the screen at the touch of a key. # HM5004 \$14.95

All programs use 16K RAM.

ENTERTAINMENT

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- **JEOPARDY** # FG1003 \$12.95
- **VEGAS** # FG1004 \$12.95
- **AIR ATTACK** # FG1006 \$12.95
- **GUARD THE PRESIDENT** # FG1007 \$12.95
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- **COMBO PACK II** Contains Vegas and Jeopardy # FG1009 \$18.95
- **COMBO PACK III** Contains Demolisher and Air Attack # FG1010 \$18.95
- **COMBO PACK IV** Contains Guard The President and Submarine # FG1012 \$18.95

All programs use 16K RAM.

Limited warranty—Defective Software will be replaced if returned within 30 days.—Memotech Products: 180 days—Seikosha Printer: 90 days

SOFTWARE REVIEW

Program: Reversi
Price: \$19.95 plus \$2.50 (P&H)
ROM/RAM required: 8K/16K
Printed listings? No
Program listable? Yes
Challenge: Fair
Display: Good
Written by: Peter Ulrich
From: Zeta Software
POB 3522
Greenville, SC 29608
803/246-1741

Zeta's Reversi offers many impressive features. Machine code makes it quick and responsive. You choose among three modes of play and ten functions. You can play against the computer or your ZX/TS can play both sides.

One function calls a list of possible moves giving coordinates and a rating of + (plus) or - (minus) 0 to 9. This list can be used by both computer and player

and lets you see how your ZX/TS decides what move to make. This function takes from 6 to 40 seconds depending on the number of possible moves and your choice of FAST or SLOW. There are ten levels of play but the response time is about the same for each; 3 seconds in FAST mode and 12 seconds in SLOW mode.

Entire game listings of completed moves may be called up on screen at any time. Or if you are unable to complete a game you can save your game that's in progress for later play.

It says in the catalog you can take back moves but, I found this somewhat misleading. With each move, your choice appears on the display board with an option to enter or delete your choice. You also can alter your position by entering coordinate and color one disk at a time. This can be tedious if you want to enter a middle or end game position.

If you were a U.S. Othello Association member you might be disappointed in Reversi. Starting disk placement is off by a 90 degree rotation. Also its style of play seems to have been taken from refuted strategies of Hasegawa's book How to Win at Othello. Your ZX/TS computer takes an opportunity to take the lead as soon as possible and flips way too many disks for opening and midgame play.

Playing Zeta's Reversi against Fidelity's Reversi gave interesting results. With Zeta's Reversi at its highest level in all games it lost as black and white against Fidelity's Reversi at its lowest level. But with Fidelity's Reversi at level 10 (of 18 levels) Zeta's Reversi did much better losing as black 31-33 and winning with white by a wipeout at move 30.

For those players who have not studied or played Othello extensively, Zeta's Reversi provides sufficient challenge.

David Ratliff, Magee, MS

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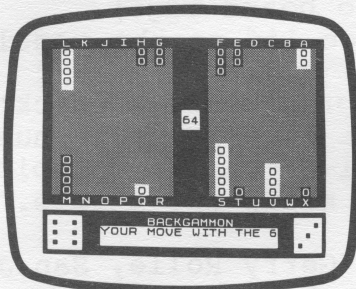
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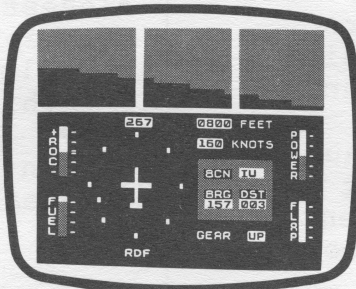
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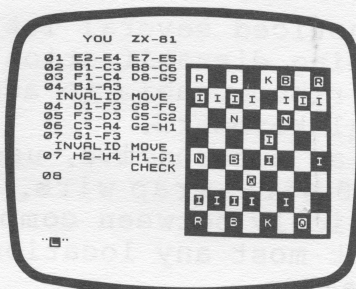
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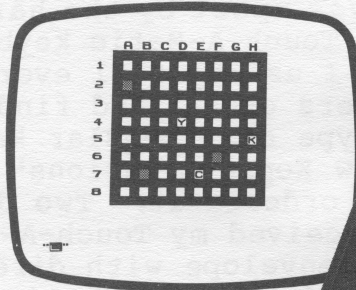
BACKGAMMON



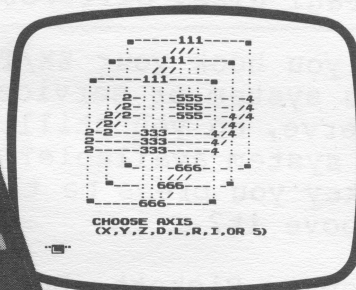
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The Timex/Sinclair 1000* is a fully programmable computer with a powerful BASIC language and complete instruction manual, all for only \$79.95. The moment you sit down with the TS1000 you can learn how to program your own games. Maybe you want to create a stock market game, a word game, a mathematical game. The challenges are endless.

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Of course, you might also want pre-programmed software cassettes for your \$79.95 computer. You'll have a wide choice with our free software catalog which comes with the TS1000. And the software cassettes play in any cassette recorder.

The 16K Memory Module. More power to you.

Let's say you want to go one step further. The 16K Memory Module allows you and your family to be challenged by even more sophisticated games. Not mindless arcade games, but serious, intellectually stimulating games which are both fun and educational.

The Memory Module costs only \$49.95 and plugs onto the back of the TS1000 for 8 times more memory capacity. A whole new world of software is available to those with the 16K Memory Module.

The Serious Games Package. A \$75 value for only \$50.

For those who want a lot of serious 16K games, Sinclair announces a special software offering with a \$25 savings! Now, for the first time, you can receive all five games shown above at the reduced price of only \$50.

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Flight Simulator: Maneuver and land a light aircraft with full cockpit controls, instrumentation and navigational aids. You have to allow for wind velocity and direction, rate of descent and mountainous terrain.

Cube Game: Every bit as mind-baffling as Rubik's Cube.

Backgammon: Everyone's favorite. Again, you can play against another opponent or against the computer. Complete with a doubling cube.

Mixed Game Bag: A series of memory and concentration tests including Robot Wars, a version of "Master Mind".

There's never been a better value on a serious games package. And to think it all starts on a \$79.95 computer!

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Another reason to order today is convenience, by toll-free phone. No crowds, no waiting lines, no parking worries. It's never been easier to get started in the world of computers. Or more worthwhile.

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Just call our toll-free number and use your MasterCard or VISA. Or send the coupon with a check or money order. Then try out the Timex/Sinclair 1000 for 10 days at no risk. If you're not entirely satisfied, we will refund your money. It's as easy as that. (Sorry, no refunds on software.)

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*Sinclair technology is the heart of both the ZX81 and the Timex/Sinclair 1000 computer.			

sinclair

DEAR EDITOR

I noticed several letters indicating dissatisfaction using a flat ribbon cable to add an external keyboard.

As an alternative, use number 28 or 30 wire-wrap wire. It positions nicely between components and exits at most any location between case halves.

Paul Hise, Jeffersonville, IN

If you hook your ZX/TS to an on-line system or service such as Comuserve, do you still have your cursor system available? Will the first key you press be the command word above it?

Christopher Fickett, Burlington, MA

When you add a modem to your computer, you use it with a program that defines the behavior of your computer. You can compare your ZX/TS plus modem plus software to a game program--while you use the game, the program controls the behavior of the keyboard and screen. Thus, availability and utility of the ZX/TS cursor system depends on the software you use. Generally command words will not be the first response, nor would that be useful since other systems would not read the byte sent as a keyword.--KO

In the event anyone wants to connect a video monitor to the ZX/TS, the procedure is:

- 1) Open the case and expose the side of the board with ICs and RF modulator.
- 2) Open lid of the RF modulator.
- 3) Remove all connections from output of the modulator.
- 4) Leave the three connections removed, tied together.
- 5) Solder plastic coated copper wire (solid) to center pin of output on the modulator (where the three connections used to be).
- 6) Solder the other end of the

bare wire input to modulator (wire closest to board edge).

7) Replace lid on the modulator and close case.

This procedure is quick and easy. The video monitor must be set on "Hi-Z" only. The picture is clear, sharp and stable.

Gerry Rolle, San Jose, CA

When I read the premier issue of SQ, I was upset by the hardware review of Touch-A-Matic keyboard overlay. I use my ZX81 every night for my users group, and find it hard to type on a regular keyboard. When I saw Kopak Creations' ad in SYNTAX, I ordered it. Two days later I received my Touch-A-Matic in a neat envelope with directions.

What a difference Touch-A-Matic made on my ZX81. I've encouraged group members to purchase Touch-A-Matic, and I'm happy to say we're pleased with this fine product.

Michael Wilson, ZX Users of
America, New York

When loading a program from tape is complete, my computer bombs out. I played around with my tape and found a recording flaw. Is there some way of entering a fake END statement so the ZX/TS thinks that it has the whole program?

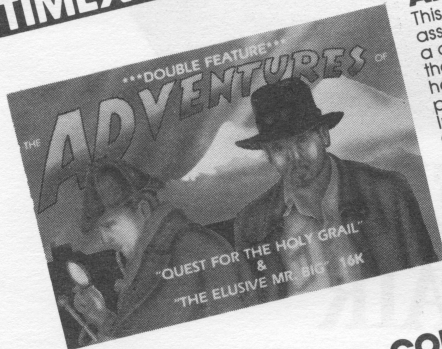
I have a long program that I don't want to retype. The computer takes 90% of it before it bombs out. Would it work if I hit break before the flaw and enter END? I don't know machine code well enough to try it.

John Broussard, Tucson, AZ

I don't know how to enter an END statement to solve this problem. But, with a ZX-99 Tape Controller (Sept.82) you could read material in, edit it, re-record it and load the edited version. Check with the Phoenix user's group, 602/846-2882; Randy Saxton.--KO

NEW RELEASES

TIMEX TS1000/SINCLAIR ZX81



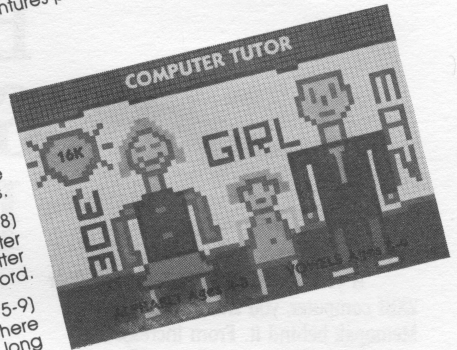
THE ADVENTURES OF QUEST FOR THE HOLY GRAIL AND THE ELUSIVE MR. BIG 16K 17.95

This adventure DOUBLE FEATURE is actually two different adventure stories on one tape. You assume the role of the leading characters—a hardbitten detective in THE ELUSIVE MR. BIG and a dare-devil archeology professor in QUEST FOR THE HOLY GRAIL. A special feature, unique to these adventures, is that each time you play they will be different—the clues, the criminal, the helpful objects and the solutions are randomly generated and will change every time you play. You can also choose your own time limit. In QUEST FOR THE HOLY GRAIL you have landed on a lush volcanic island where the lost Holy Grail is hidden. But if you can outwit your arch enemy, Le Mechant (the Nazi sympathizer), evade the hungry natives, descend into the underground passageways and find the Grail, then you might stand a slim chance of getting back to your hydroplane and escaping before the volcano erupts.

COMPUTER TUTORS 16K 14.95

ALPHA AND VOWEL TUTORS

are a series of programs developed by SOFTSYNC which are specially designed to both educate and entertain children. With the use of computer-generated pictures and words, these two programs, presented on one cassette, create visually interesting tutorial programs to help children learn the letters of the alphabet and the use of long and short vowels.



This program generates three random pictures and their corresponding words with the first letter missing. At the bottom of the screen, a letter of the alphabet is displayed which is the missing letter from one of the words. With the help of the pictures, students learn to match the letter to the correct word.

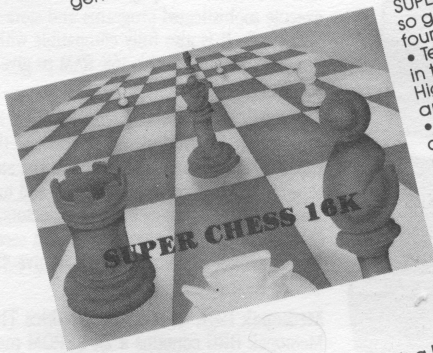
VOWEL TUTOR (ages 5-9)

This program is similar to ALPHA TUTOR but also includes additional features: For each vowel there are three short and three long vowel examples. On the MENU, option 1 displays words with only long vowels and corresponding pictures. Option 2 displays short vowel drills while option 3 randomly generates either three short or three long vowel words at a time. Both programs are designed to give students positive reinforcement and allow learning at the student's individual pace.

SUPERCHESS 16K 19.95

SUPERCHESS is probably the most advanced chess game available for the ZX81 and TS1000 computers—so good you'll probably start to talk to it. SUPERCHESS is an extraordinary player and has many features not found in any other computer chess game. Some of the features include:

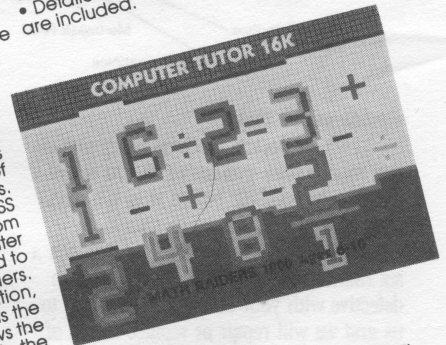
- Ten levels of play. Overall response time to moves in the first five levels are within tournament time limits.
- Higher levels are designed for extended games and problem solving.
- Select the style of game you wish to play by choosing tactical or positional evaluation.
- ANALYZE feature allows you to set up and/or change a position by adding and removing pieces.
- All legal moves including castling and pawn capture en passant are allowed.
- "SUPERCHESS" like many chess players has a store of standard openings.



MATH RAIDERS 16K 14.95

Can children learn math and have fun doing it? Playing MATH RAIDERS 1000 they will because this graphically exciting and educationally rewarding program combines valuable math tutorial exercises with the irresistible fun of arcade games.

The program invites students to take command of the USS RAIDER 1000, a spaceship on a mission to defend Earth from alien invaders. A personalized routine allows a player to enter his or her name as Captain and the computer will respond to the Captain's orders. The Captain has four weapons to choose from: Addition, Subtraction, Multiplication and Division, and soon learns the best defense is the right answer! A right answer allows the Captain to fire at the invaders who are trying to penetrate the atmosphere. With two levels of play, MATH RAIDERS 1000 is an ideal computer tutor for children six to ten years old.

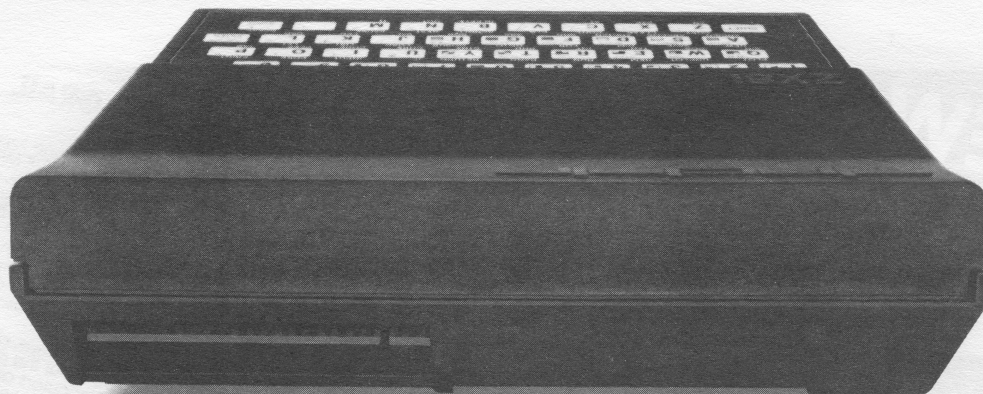


NIGHTGUNNER 16K 14.95

You peer into the inky black sky from your position as the tail gunner in a bomber plane, searching for enemy aircraft. Suddenly from above, a fighter plane swoops down, machine gun bullets flaring at you. You swing your tail gun into position, line up your sights and fire. "Take that, you dusty little hunchback!" you yell with satisfaction as the aircraft disappears from the sky. But such triumphs are short-lived when you play NIGHTGUNNER because there are always more enemy planes coming at you from all directions, weaving randomly in any direction and fire. But each round gets faster and harder.

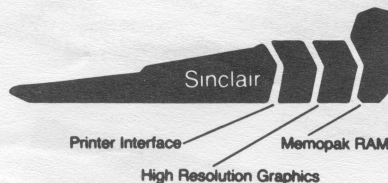
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Memopak 64K RAM The 64K RAM extends the memory of your Sinclair by 56K to a full 64K. It is directly addressable, user transparent, is neither switched nor paged and accepts such basic command as 10 DIM A (9000). The Memopak 64K turns your Sinclair into a powerful computer suitable for business, recreational and educational use. No additional power supply is required.

Memopak 32K RAM The 32K RAM Memopak offers your Sinclair a full 32K of directly addressable RAM. Like the 64K Memopak, it is neither switched nor paged and enables you to execute sophisticated programs and store large data bases. It is also fully compatible with Sinclair's or Memotech's 16K RAM to give you a full 48K of RAM.

Memopak 16K RAM The Memopak 16K RAM provides an economical way to increase the capabilities of your Sinclair. And at the same time, it enables you to continue to add on other features with its "piggy back" connectors. It is compatible with the Sinclair 16K or a second Memopak 16K or Memopak 32K to give 32K or 48K of RAM respectively.

Memopak High Resolution Graphics The Memopak HRG contains a 2K EPROM monitor and is fully programmable for high resolution graphics. The HRG provides for up to 192 by 248 pixel resolution.

Memopak Printer Interface The memotech centronics parallel or RS232 printer interface packs enable your Sinclair to use a wide range of compatible printers (major manufacturers' printers available through Memotech at significant savings). The resident software in the units gives the ASCII set of characters. Both Memopak printer interfaces provide lower case character capabilities. The RS232 Interface is also compatible with modems.

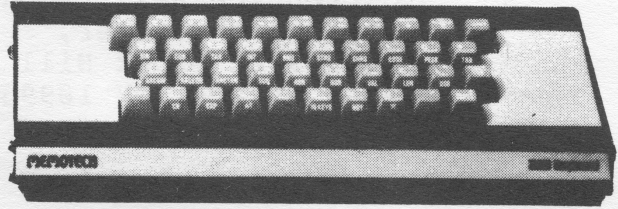
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MEMOTECH INTRODUCES THE ZX81/TS-1000 KEYBOARD

The Memotech keyboard is a high quality standard (typewriter) keyboard, with Sinclair legends. The keyboard is housed in a well engineered and elegant aluminium enclosure. It is cable connected to the accompanying buffered interface which is housed in a Memopak case and plugs directly onto the back of the computer. As with other Memotech products, the piggy-back tradition is maintained, allowing other add-ons to be plugged onto the back of the interface. **Priced at \$99.95** (Plus \$4.95 for shipping and handling).



THE FOLLOWING PRINTERS ARE ALSO AVAILABLE THROUGH MEMOTECH

SEIKOSHA GP 100

The Seikosha GP 100 uses a 5x7 dot matrix printing format with ASCII standard upper and lower case character set. Printing speed is 30 characters/second with a maximum width of 80 characters. Character spacing is 10 characters/inch with line spacing of 6 lines/inch or 9 lines/inch. The printer uses standard fanfold paper up to 9½ inches wide. The GP 100 utilizes a standard parallel interface (Centronics compatible). **Priced at \$399.00 including Centronics parallel interface & cable.** (Plus \$9.95 for shipping and handling).

SEIKOSHA GP 250

The GP 250 is also manufactured by Seikosha, the leading company of the Seiko group. It uses a 5x8 dot matrix printing format with ASCII standard upper and lower case character set. Printing speed is 50 characters/second with a maximum width of 80 characters. Character spacing is 10 characters/inch. The GP 250 also uses paper up to 9½ inches wide. This printer utilizes either standard parallel Centronics interface or serial (RS232, DIN connector) interface. **Priced at \$449.00 including Centronics parallel interface & cable.** (Plus \$9.95 for shipping and handling).

PROWRITER 8510

The Prowriter 8510 is a Leading Edge product. It uses a 7x9 dot matrix printing format with ASCII standard upper and lower case character set. The printing speed on the 8510 is 120 characters/second with a maximum width of 80 characters. The 8510 utilizes a standard Centronics parallel interface. **Priced at \$649.00 including Centronics parallel interface & cable.** (Plus \$9.95 for shipping and handling).

To order any of the above items, call Toll Free 1 800 662 0949 or write:

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BOOK REVIEW

Title: Mastering Machine Code on Your ZX81
Author: Toni Baker
Publisher: Reston Publishing Co.
c/o Prentice-Hall, Book Distribution Center,
Route 59 at Brook Hill Dr., W. Nyack, NY 10995
Price: \$12.95

Many things bother me about Toni Baker's book. But, this book is invaluable if you want to expand your programming potential and stretch your ZX/TS to its limits.

If you're disenchanted with sluggish ZX/TS graphics or limited number of BASIC commands, then you're ready to move into machine language. Baker's book gives you an easy intro to machine code and focuses on your ZX/TS computer rather than the Z80 microprocessor.

Toni Baker's book is written for ZX/TS users who know BASIC but

have no background in machine language. She begins with an elementary explanation of hexadecimal math and ends by disassembling the ZX81 ROM. She occasionally pauses to patiently explain instructions and routines. She also illustrates more difficult concepts by using them in such programs as Life, Spirals and Draughts. Baker also includes a program that lets your ZX/TS generate two whole octaves of musical notes. In my opinion, this program alone makes Mastering Machine Code worth its price.

Toni Baker's writing, or more correctly, teaching style is informal, almost chatty. She encourages you to experiment and modify programs to reinforce newly acquired skills. Although Baker's Mastering Machine Code progresses slowly, it encourages you to think through each process before going on. The end results are faster execution of your programs and better use of your machine's memory.

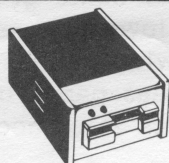
I found several aspects of the book disappointing. It wasn't until Chapter 2 that I realized that Mastering Machine Code was written for both ZX81s and ZX80s. What a surprise! No mention is made of ZX80s in the title, introduction or back cover blurb. Interruptions in narrative to explain "old ROM" and "new ROM" differences should be mentioned earlier on.

It is painfully obvious that Mastering Machine Code is some kind of photo reproduction of typed manuscript pages. For the \$12.95 price I feel entitled to a properly proofread, typeset book. I also found local British idioms to be disconcerting--and in places they obscure Baker's meaning.

Mastering Machine Code covers a difficult subject, but if you devote some time to your ZX/TS computer and Toni Baker's book you'll end up speaking a language other than BASIC.

John Connell Jr., Middletown, RI

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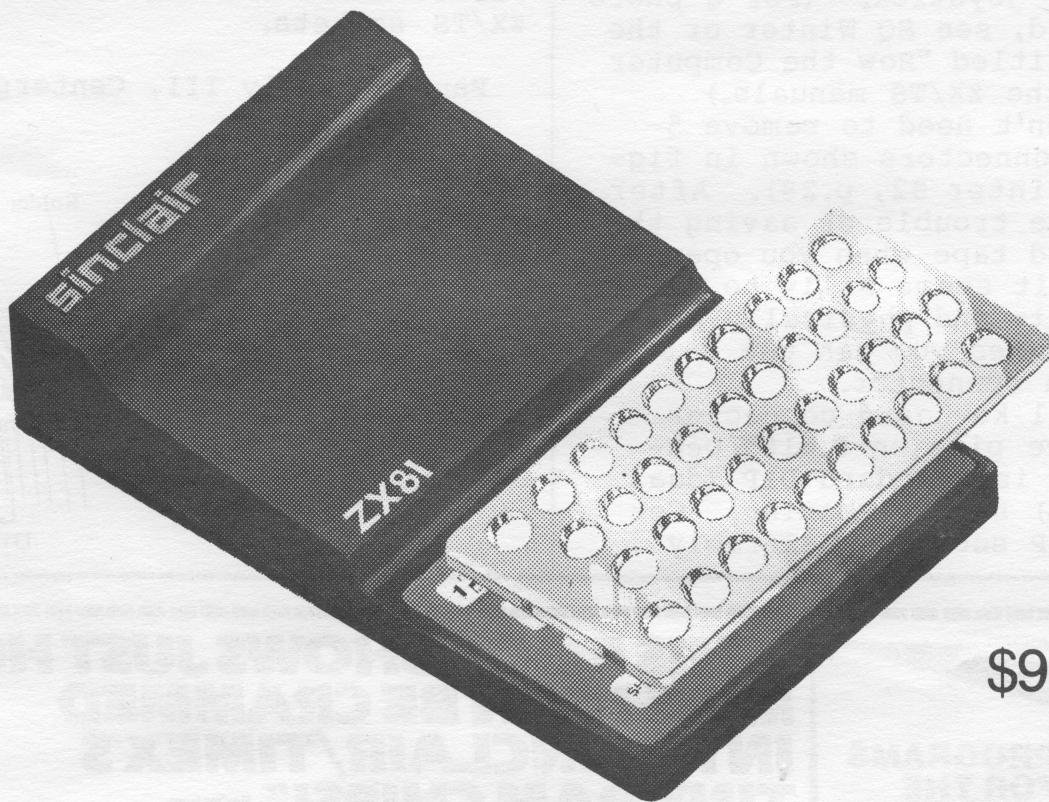
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HARDWARE TIP--KEYBOARD CONVERSION

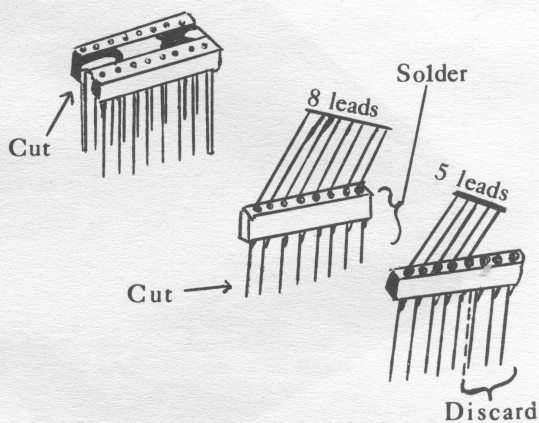
If you plan to try the keyboard conversion shown in SQ (premier issue, Winter 82), try using a 16-pin DIP socket (wire wrap), cut in half for plugging your keyboard cable into your ZX board. Use this simple plug as a connector to any keyboard or joystick. (For a photo of the board, see SQ Winter or the chapter entitled "How the Computer Works" in the ZX/TS manuals.)

You don't need to remove 5- and 8-pin connectors shown in figure 3 (SQ Winter 82, p.28). After going to the trouble of saving the double-sided tape when you opened your case, it seems silly to void your warranty and physically modify your ZX/TS when you can use a \$.50 part for a connector.

Original keyboard connector sockets have pins on 0.010" centers. This is standard DIP (dual in-line pin) socket spacing. Get a 16-pin DIP socket (preferably

wire-wrap type) and cut connecting bridges to create two 8-pin single-in-line packages (SIP). Strip the 5- and 8-wire cables from your new keyboard and plug them into appropriate pin holes on each SIP (disregard or remove the extra three slots on one SIP), then solder in place. Cut the long wire-wrap pins off to about 1/4" and insert in ZX/TS sockets.

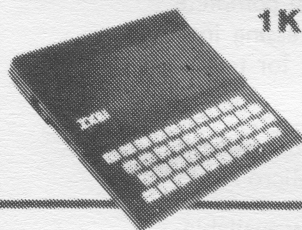
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HARDWARE REVIEW

Product: JK Audio Model JK-310
I/O Board with Real
Time Clock
From: JK Audio, P.O. Box 3295,
Escondido, CA 92050-0580
Price: \$59.95 (assembled and
tested) plus \$3.95 (P&H)

JK-310 is ideal for your applications and projects that require a real-time clock.

JK-310 uses an OKI semiconductor MSM5832 real-time clock chip. It runs independently of your computer and is addressed directly from software when needed. Battery backup is provided for, so you just program the day, date and time once and forget it.

JK-310 is an impressive piece of hardware. It has its own 5-volt regulator and an interesting multiplexing scheme. It runs four memory locations into both the clock read and write ports and up to eight 8-bit inputs or outputs. It comes set-up with edge connector access to control port for further multiplexing, clock, one buffered 8-bit input port, a buffered 8-bit output port, and direct access to the data bus. JK-310's standard ZX bus connector is compatible with RAM packs, etc. The package uses four memory locations, 16380-3.

MSM5832, running with a 32 kHz clock, keeps automatic track of seconds, minutes, hours, day and date, month, year and even leap year. It is accessed by a POKE which tells the hardware which digit you want to know and a PEEK which looks at the digit. JK provides BASIC software (using 2K RAM or less) to get time data and then print it out.

Both clock and I/O ports use 74LS374 & 74LS139 logic chips to decode 4 memory locations into various port configurations and simulate more expensive peripheral I/F adapter chips. This decoding scheme brings 6 more I/O control

lines to the 44-pin edge connector.

On the negative side, output ports can only sink about 40 mA, which isn't enough for common 5V relays. This means another power supply would be required. For example, if you have another transformer, a 24 volt relay would be sufficient for 40Ma. (JK Audio says Radio Shacks DPDT with 12VDC coil, #273-213, works fine.--Ed)

JK-310 is professionally designed mechanically and electrically. Complete schematic and data on the OKI time chip is provided. Documentation, however, is sparse and hard to follow. You'll also need 3 NiCad AA batteries. Check the supplied battery holder polarity; mine was backwards.

JK-310 is a powerful ZX/TS addition. With simple interface circuits (schematics provided), you can use it for many applications where exact time is important.

Paul Donnelly III, Centerport, NY

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Hunter tells us that their nonvolatile RAM board (reviewed in SQ, Winter 82) requires modification to work in systems with more than 32K conventional RAM.

Remove 74LS139 (IC5), bend pin 1 up and over pin 2 without contact. Buy a 74LS32 (available from Radio Shack), bend pins 1 and 2 directly out, pin 3 out and under pin 2, pins 7 and 14 sideways, and cut off pins 4-6 and 8-13. Mount the 74LS32 on top of the 74LS139 with pin 1 above pin 1 and solder:

<u>74LS139</u>		<u>74LS32</u>
pin 16	to	pin 14
pin 8	to	pin 7
pin 1	to	pin 3

Solder 1" insulated flying leads to pins 1 and 2 of the 74LS32.

Reinsert the two ICs into the socket for IC5. Solder one lead to A15 and the other to MREQ on the edge connector. This completes decoding on the Hunter RAM board.

BOOK REVIEW

Title: 49 Explosive Games for the ZX81

By: Tim Hartnell

From: Reston Publishing Co., Inc.
c/o Prentice-Hall Inc., Book
Distribution Center, Route
59 at Brook Hill Dr., W.
Nyack, NY 10995

Price: \$10.95

(softcover, 140 pp.)

Any ZX/TS owner with children or a limited budget for commercial game software will want a copy of this book. Tim Hartnell covers a wide range of games providing something for everyone.

49 Explosive Games is a dual purpose book. The book's program listings are also intended to broaden your programming skills. Hartnell says, "We've tried to ensure that each and every program contains at least one programming technique which you'll adapt for

your own programs."

Hartnell lists games of all imaginable types: mazes, adventures, racing and landing games, and of course alien blast games. He includes Life, Draughts (Checkers), and several unique pattern generators. In some games you are pitted against the logic of your computer; in others your foe is the insidious random number generator.

Hartnell's book gives many hours of good fun in both playing and programming "49 explosive games." He is not overly concerned with authorship pride. He invites you to enjoy "...working with them, altering them...deleting some sections, improving others, and so on, until the game carries your personal stamp." In many cases he offers hints on potential game improvements or ZX81 to ZX80 conversions.

When you consider the per game cost is something less than 25 cents, you get a real bargain with this book. Another bonus: 1K and 16K games come with directions on how to play them and programming techniques used. ZX80 owners will find 28 games for their machine.

One fault with 49 Explosive Games lies in its visual presentation. About two-thirds of program listings are apparently reproduced directly from ZX/TS printers. This may build confidence that programs are correctly listed and really run, but it detracts from program readability. Fortunately, Hartnell foresaw this problem and repeats troublesome keystroke patterns. Inverse graphic and alphanumeric characters suffer the most from this treatment.

I strongly recommend this book to any new ZX/TS owner and to users who have children beginning to take interest in programming. Some ZX81 veterans will find this book interesting too, but many will have already progressed beyond the scope of 49 Explosive Games.

John Connell, Middletown, RI

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